

The effect of men's body attitudes and motivation for gym attendance.

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Abstract

The current study integrates men's body attitudes with implicitly and explicitly measured motivation to investigate the role of these factors in predicting gym attendance. Male participants (N = 99) who regularly attended a gym were recruited to participate in an online questionnaire. Participants completed implicit and explicit measures of motivation, explicitly-measured men's body attitudes, and reported the average number of gym visits per week. Attitudes related to body fat and explicitly-measured autonomous motivation significantly predicted typical gym attendance. Implicitly-measured motivation significantly and negatively predicted gym attendance. Results indicate some support for a dual-systems account of gym attendance. Men's body attitudes and autonomous motivation influences gym attendance; however, implicitly-measured motivation showed antagonistic effects. While individuals may explicitly state their autonomous motivation for gym attendance, attendance may be influenced at the explicit level. Health and fitness professionals may improve gym attendance by focusing on people's reasons for attending a gym, facilitating autonomous motivation in clients, and minimising the influence of controlled reasons for exercise.

KEYWORDS: body dissatisfaction; motivation; gym; attitudes; implicit

INTRODUCTION

A body of research has focused on how men's attitudes towards their body influence exercise-related behavior [1-5]. Men who experience dissatisfaction with their body are likely to spend more time exercising and attend a gym more regularly [6]; however, the motivational orientations of such gym-goers (i.e., the nature of the rationales behind engaging in exercise at the gym) remains largely under investigated. The current research integrates men's body attitudes and motivation from a self-determination theory perspective [7] to assess the relationship with gym attendance. In addition, a recent theoretical development in self-determination theory incorporates implicit, non-conscious motivation, which can be measured by an *implicit association test* [IAT; 8]. Incorporating both explicit and implicit motivation measures can contribute to theory by examining the extent to which men who attend the gym regularly do so due to impulsive, automatic motivation; or reflective, conscious motivation. This is the first study, to the authors' knowledge, to combine men's body attitudes with explicit and implicit measures of motivation.

A panoply of research outlines men's desire to become more muscular and lower their body fat [5, 9, 10]. Up to 95% of college-age males report being unhappy with their body appearance, which may lead to body dysmorphia [11]. In order to better understand men's attitudes toward their body and how they influence exercise and dietary behaviors, several scales have been developed. The *male body attitudes scale* [MBAS; 12] is one such scale that reflects dimensions of male body dissatisfaction, based on theoretical and empirical literature [13]. The MBAS outlines three dimensions related to muscularity, body fat, and height and has been validated in recent research (Tylka et al., 2005). While the majority of research has focused on the classification of body dissatisfaction [1, 2], less is known about the relationship between motivation and attitudes and their relation to gym attendance.

Research has shown that attitudes alone are unlikely to lead directly to behavior [14]; and may be formed consistent with the qualities of an individual's motivation towards engaging in that behavior [15]. Accordingly,, researchers have included measures of motivation to complement attitudinal constructs [e.g., 16]. Self-determination theory [SDT; 7, 17] is a meta-theory of human motivation that has been applied to a range of health-related behaviors, such as physical activity and exercise [18]. Self-determination theory also emphasises the role of the individual's cognitions on the quality of motivation, which is separated into *autonomous* and *controlled* forms of motivation. Individuals engaging in behavior through a sense of volition or choice are autonomously motivated, and likely to feel a sense of intrinsic enjoyment or satisfaction when carrying out that behavior [19].

Autonomously motivated individuals are likely to persist with gym attendance without external contingencies such as rewards or pressure. In contrast, individuals experiencing controlled motivation perform behaviors for the attainment of external rewards (e.g., money, recognition), or to avoid feelings related to self-esteem such as guilt or shame [20]. For instance, males may feel guilty for missing or skipping gym sessions, and fear the outcomes (e.g., gaining weight, losing physique). The majority of research using self-determination theory has emphasised the need to support autonomy and facilitate autonomous motivation to engage and persist in health behaviors [21-23]. However, while autonomous motivation is considered important in behavioral engagement and persistence, controlled motivation may continue to influence behavior when external or self-esteem-related contingencies remain. For instance, individuals who feel ashamed of their body may attend a gym in order to see physical results; as long as the perception (shame) regarding their body persists, so too will the rationales for gym attendance [20].

A further premise of SDT relates to individual differences in dispositional motivational orientations. These orientations reflect relatively enduring, and distal influences

1 across a wide range of behaviors, and are outlined in the *general causality orientations scale*
2 [GCOS; 24]. For example, when receiving a promotion at work, an individual might think to
3 ask how much money they will make in their new role, reflecting a control orientation; or if
4 the new role will be challenging or enjoyable, reflecting an autonomy orientation [17].

5 Recent research has identified that these orientations influence behavior at both explicit and
6 implicit levels [25, 26]. While several attempts have been made to measure implicit
7 motivation in relation to behavior [25, 27], the implicit association test [IAT; 8] has
8 increasingly used. A reaction time-based task, the motivation IAT paradigm suggests
9 individuals who hold autonomy orientations will respond quicker to the pairing of self (e.g.,
10 'me') and autonomous (e.g., 'freely') words, than the pairing between self and controlled
11 (e.g., 'forced') words. Conversely, individuals who hold exhibit control orientation at the
12 implicit level will sort the latter pairing (self and controlled), quicker. Through a number of
13 studies, Keatley and colleagues [24,25,29] have found implicitly-measured motivation
14 predicts engagement and performance across a range of health behaviors, including physical
15 activity. The current research extends these findings by investigating the role of implicit
16 motivation alongside other variables related to physical activity (e.g., gym attendance), such
17 as body attitudes.

18 In order to conceptualise the patterns of effects of explicit and implicit measures on
19 behavior, several dual-process or dual-systems models have been proposed [28, 29]. It is
20 important to measure implicit and explicit measures together in order to fully investigate the
21 patterns of effects between the two measures in predicting behaviour [30-33]. Both the
22 implicit and explicit measures may act synergistically or antagonistically to predict behaviour
23 [31]. For instance, an *additive* pattern suggests that both systems affect behaviour
24 independently; *multiplicative* patterns suggest the two measures interact to affect behaviour;
25 and *double dissociative* patterns suggest that implicit processes predicts unplanned

behaviours, while explicit processes better predict planned behaviours [31]. Only by taking into account both implicit and explicit measures together, can we understand which patterns is supported. In particular, Strack and Deutsch [28] developed the *reflective-impulsive model* (RIM), which attempts to comprehensively and parsimoniously account for the role of implicit, impulsive and explicit, reflective processes that influence behavior. In the RIM, the reflective system is related to deliberative, planned behaviors, leading to intentions for future states and goals. The impulsive system, in contrast, comprises processes that arise from the reflective system or perceptual inputs and is underpinned by associative networks. To this extent, explicit, self-report measures are proposed to provide an account of the reflective system, while implicit measures, such as the IAT, are well-positioned to provide an account of the associative networks.

The aim of the present study was to investigate the influence of men's body attitudes alongside implicit and explicit motivation on gym attendance. We measured these influences while controlling for body mass index (BMI). From this framework, a number of hypotheses were derived. Based on previous research into men's body attitudes and its effects on behavior [13], we hypothesised that men with negative body attitudes would report greater gym attendance (H_1). We also hypothesised that explicit measures of motivation at the proximal (i.e., Perceived Locus Of Causality) and distal (i.e., General Causality Orientations Scale) levels would predict gym attendance (H_2). Specifically, autonomous motivation would predict attending the gym for reasons of choice and enjoyment, while controlled motivation would reflect gym attendance due to extrinsic reasons or for reasons related to self-esteem. This hypothesis was based on previous literature showing the relationship between types of motivation and physical activity behaviors [34, 35]. Last, we hypothesized that implicit motivation would predict gym attendance (H_3), similar to explicit measures. This hypothesis

is based on previous research showing the relation between implicit autonomous motivation and physical activity [18, 36].

METHODS

Approach to the problem

The current study was a cross-sectional study using online resources to measure participants' body attitudes and motivation types. The variables and types of measure were carefully selected based on their precedence in the literature as well as their suitability for answering the research questions.

Subjects

A total of 100 male participants ($M_{\text{age}} = 30.40$, $SD = 11.10$) participated in the study, with an average BMI for the sample was 25.83 ($SD = 6.62$). The majority of the sample (57.3%) endorsed *health and fitness* as their primary reason for attending a gym or fitness centre, following by *appearance* (16.7%), *amateur body building* (16.7%), *training or competing* (8.3%), and *other* (1%). Participants reported an average gym or fitness centre attendance of 2.46 ($SD = 1.71$) sessions per week, typically lasting 1.06 ($SD = .742$) hours. We used the Borg Scale [37] to measure typical gym or fitness centre exertion, multiplying scores by 10 to approximate heart beats per minute during routines ($M = 124.1$ [*fairly light to somewhat hard*]; $SD = 87.1$; Median = 130). All participant data were entered into analyses, save for one participant who did not provide data for gym attendance ($N = 99$). Ethical approval was granted by the [name omitted] university ethics committee. Individuals were eligible to participate in the study if they were male, fluent English speakers, and attended a gym or fitness centre frequently.

Procedure

Data Collection. Participants were recruited online, where they were provided with study information and indicated their consent to participate by clicking the 'I agree' button

before advancing to the questionnaire. The order of presentation of the measures was randomised, such that participants received either the IAT before or after the questionnaires. The order of scales in the questionnaire was also randomised. Participants progressed through the questionnaires at their own pace, which lasted approximately 25 minutes. Completion of the IAT took approximately five minutes. All participants were given a \$2 USD inconvenience allowance for participating. While the IAT was administered online, it is set-up to download and run using participants' own operating system; therefore, there were no issues relating to lag or internet speeds.

Measures. The revised male body attitudes scale (MBAS-R)¹ incorporates some revisions to the original MBAS by Tylka et al. [13], measuring men's attitudes towards their body fat and muscularity. As we were interested in men's attitudes towards their body that could be targeted by attending a gym or fitness centre, we included only the *body fat* and *muscularity* subscales of the MBAS-R². Participants responded to a series of statements regarding body fat (e.g., *seeing my reflection [e.g., in a mirror or window] makes me feel badly about my body fat*) and muscularity (e.g., *I think my arms should be more muscular*) on a six-point scale from 1 (*never*) to 6 (*always*). Cronbach's α values for the subscale scores for the total muscle (MBAS_{Musc}) and body fat (MBAS_{BF}) were .87 and .89, respectively.

The perceived locus of causality (PLOC) was adapted to apply to motivation related to attending the gym or fitness centre to exercise and work out. Participants evaluated a series of statements reflective of their underlying motivational regulations (e.g., *"I feel under pressure to exercise or work out regularly from people I know well"*) using a scale from 1 (*"not true at all"*) to 4 (*"very true"*). Weighted means were calculated for the resulting PLOC

1 The original MBAS 12. Tylka, T.L., D. Bergeron, and J.P. Schwartz, *Development and psychometric evaluation of the Male Body Attitudes Scale (MBAS)*. Body Image, 2005. 2(2): p. 161-175. was also tested in the regression models and a similar pattern of results were found. In keeping with developments in the literature, we report the revised version in the current article; alternative results using the original MBAS are available from the first author, on request.

2 We initially included MBAS-height, however removal of the predictor did not substantially change the results.

1 scores according to previous research to create scales for *autonomous motivation* (i.e., 2 x
2 intrinsic motivation + identified regulation; Cronbach's $\alpha = .83$) and *controlled motivation*
3 (i.e., 2 x extrinsic regulation + introjected regulation; Cronbach's $\alpha = .61$)³.

4 The general causality orientations scale [24] measures individuals' general or
5 dispositional motivation orientations, comprising a series of vignettes and associated responses
6 reflective of autonomous and controlled motivational orientations. An example vignette refers to
7 receiving a new position at a company; participants indicate how likely they will respond by
8 thinking, "Will I make more at this position?" (i.e., control orientation; Cronbach's $\alpha = .88$), or,
9 "I wonder if the new work will be interesting?" (i.e., autonomy orientation; Cronbach's $\alpha = .71$).
10 Participants rate the likelihood of responding in these ways on a seven-point Likert-type scale
11 from 1 ("very unlikely") to 7 ("very likely"). There were 12 vignettes in total, each with two
12 statements, one pertaining to autonomy orientation, the other pertaining to control orientation.

13 Implicit autonomous and controlled motivation were measured with the motivational
14 IAT [25, 27, 36]. Words relating to autonomous motivation (i.e., Label: *autonomous*; stimuli:
15 *choice, free, spontaneous, willing, authentic*) and controlled motivation (Label: *controlled*;
16 stimuli: *pressured, restricted, forced, should, controlled*) have previously been used to show
17 distinct representations of the two motivation orientations. Participants were given
18 information on what the forms of motivation were, emphasising the differences between
19 them. Words relating to 'self' (*I, me, my, mine, self*) and 'others' (*they, them, their, theirs,*
20 *others*) were also adopted from previous research in the area [25, 27, 36]. The category
21 'others' was described to participants as reflecting 'not-self', to prevent comparison with a
22 generalised social-comparison group. The standard 5-step IAT was used, in which blocks 1,
23 2, and 4 comprised 20 practice trials, and blocks 3 and 5 comprised 60 trials (i.e., 20 practice,
24 40 test). The critical blocks were counterbalanced. The improved scoring algorithm [38] was

³ While there is some debate regarding the structure of self-determination theory, and whether it is on a continuum [36], the current manuscript opted for the calculations shown here, in order to be parsimonious with existing literature in the area.

used to calculate the implicit motivation *D*-score, with positive scores reflecting an implicit bias to *autonomous* and *self* word pairings. All participants' M-IAT data met the inclusion criteria, as detailed in the improved scoring algorithm [38].

Gym attending behavior was measured by asking participants indicate the average number of times they attended the gym for a work-out or exercise session in a typical week. This was used as the outcome variable.

RESULTS

Initial data screening for kurtosis and skewness indicated that data could be considered normally distributed. Indicators showed no issue with multicollinearity in the dataset. Descriptive statistics and zero-order correlations between study variables are shown in Table 1. Participants' average gym sessions per week correlated significantly with perceived locus of causality autonomous motivation ($r = .52, p < .001$) and controlled motivation ($r = .31, p < .001$). Male body attitudes related to muscle ($r = .21, p = .03$) and body fat ($r = .22, p = .03$) were also significantly correlated. Finally, implicit motivation was not correlated with average gym sessions per week ($r = -.14, p = .18$).

Hierarchical regression analyses were conducted to assess the unique contribution of predictors to gym attendance. Body mass index was entered in the first step. In the second step, motivation (i.e., $PLOC_{Aut}$, $PLOC_{Con}$, $GCOS_{Aut}$, $GCOS_{Con}$, and M-IAT) and male body attitudes (i.e., $MBAS_{BF}$ and $MBAS_{mus}$) were entered. Standardised beta coefficients and statistics related to the regression analysis are included in Table 2. Body mass index did not significantly predict gym attendance in the first step, $Adj. R^2 = -.01, p = .97, F(1, 87) = .002, p = .97$. The inclusion of the predictor variables on gym attendance in the second step led to a significant increase in variance accounted for: $Adj. R^2 = .35, p < .001; F(8, 87) = 6.87, p < .001; \Delta R^2 = .41, p < .001$, with BMI remaining a non-significant predictor ($\beta = -.09, p = .45$). Average gym sessions per week were significantly predicted by $MBAS_{BF}$ ($\beta = .32, p = .01$),

but not MBAS_{mus}, providing partial support for H₁. The PLOC_{Aut} significantly predicted average number of gym sessions per week ($\beta = .56, p < .001$), although prediction by PLOC_{Con} was non-significant ($\beta = -.07, p = .51$); GCOS variables were similarly non-significant, indicating partial support for H₂. Implicitly measured motivation significantly and negatively predicted average number of gym sessions per week ($\beta = -.21, p = .03$), supporting hypothesis (H₃)⁴.

DISCUSSION

The aim of the current study was to investigate the effects of men's attitudes toward their body alongside their implicit and explicit motivation in relation to the number of times they attend a gym, per week. The research adopted a dual-systems framework to conceptualise the patterns of prediction between men's body attitudes, alongside explicit and implicit measures of motivation. A series of hypotheses based on previous literature in the area were systematically tested. The first hypothesis (H₁) related to the effect of negative body attitudes toward muscle mass and body fat, as measured by the male body attitudes scale (MBAS). The current research provided partial support for this hypothesis, indicating that men with higher negative views toward their body fat also reported greater average gym attendance per week. Considering that body mass index (our control variable) was not a significant predictor of gym attendance, it may mean that individuals attend the gym due to subjective perceptions of body weight (as measured by the MBAS), rather than actual body weight (as measured by the BMI). Given that attitudes towards muscle did not significantly predict gym attendance, it may be that the current sample was more motivated to attend the gym due to perceptions of body fat, rather than muscle mass. It should be noted, however, that participants in the current sample were slightly overweight in terms of their BMI.

⁴ Interaction terms between explicit generalised measures of motivation (GCOS) and the implicit measure of motivation were entered into the third step of the regression model, in additional analyses. These, however, were not significant predictors of behaviour and are therefore omitted. Full analyses are available from the correspondent author, on request.

1 Notwithstanding these limitations, the present results may suggest that males with higher
2 BMI place more emphasis on weight loss than muscle gain, which is an important
3 consideration for health and exercise professionals in terms of focusing interventions, in that
4 individuals with higher BMI may be more focused on weight-related issues than muscle.

5 A second hypothesis (H_2) related to the role of explicit motivation types on gym
6 attendance. In the present study, context-specific autonomous motivation significantly
7 predicted higher gym attendance per week, supporting the link between autonomous
8 motivation to engage in physical activity and continued, persistent physical activity behavior
9 [22]. This means that individuals who choose to attend the gym with a sense of volition and
10 choice are more likely to attend more often. Though controlled motivation was significantly
11 correlated with gym sessions per week, it was not a significant predictor of gym attendance in
12 our regression analyses, and therefore the hypothesis was not fully supported. It should be
13 noted that controlled motivation (PLOC) was a relatively low alpha level in the current study;
14 however the scale has been widely used and supported in the literature and it is not
15 uncommon for research using these scales to report lower reliability for controlled motivation
16 [39, 40].

17 Our final hypothesis (H_3) related to implicit motivation, which was found to be a
18 significant negative predictor of gym attendance. In the current study, higher implicit
19 controlled motivation (i.e., indicated by negative D-scores) was predictive of gym attendance
20 as opposed to implicit autonomous motivation. These results indicate that unplanned gym
21 attendance may be predicted by implicit processes. In the present study, it is plausible that
22 unplanned opportunities to attend the gym are what the implicit measure is predicting, rather
23 than habitual responses. The reason for this is that the explicit measure of controlled
24 motivation was significantly correlated with gym attendance behavior, but did not show
25 significant independent association with gym attendance. Therefore, when planning and

reflecting on reasons to attend the gym (i.e., indicated by the PLOC), individuals are likely to be influenced more by explicit autonomous motivations; when individuals do not plan or form intentions to attend the gym (i.e., a time during the day in which attending a gym becomes suddenly possible, see [32, 33]), implicit controlled motivation may be more predictive of gym attendance.

The present research takes a novel approach in combining self-determination theory with men's attitudes towards their physical appearance for predicting self-reported gym attendance. Although there is a large focus on body and muscle dissatisfaction, contemporary theories of motivation have, to our knowledge, not yet been applied to further understand the influence of differing types of motivation (i.e., controlled or autonomous) and body attitudes on gym attendance. The comprehensive testing of the hypotheses through hierarchical regression allowed the influence of motivational variables on gym attendance to be observed while controlling for BMI. The measurement of motivation at the implicit level can be considered a strength of the present study, in light of recent developments in self-determination theory. Although the Motivation IAT has been supported in various applications throughout the literature, there remains a general lack of consensus regarding which implicit test best represents influences from the impulsive system [41]. Future research should seek to corroborate the present trend in the literature by including other implicit measures, such as the single-category implicit association test [42], or the go/no-go association task [43]. These measures allow for autonomous and controlled motivation to be measured separately, which may clarify the antagonistic patterns of prediction between autonomous and controlled motivation types. Furthermore, inclusion of explicit measures of habitual behavior, such as the behavioral self-report automaticity indices [44] may also be used to establish support for automatic or habitual gym attendance, alongside implicit measures.

1 The present study carries some limitations that should be noted. Firstly, the sample
2 average BMI was slightly overweight, which may have influenced the responses on measures
3 of body attitude. The cross-sectional design can also be considered a limitation; although the
4 study was sufficiently powered, a prospective-correlational or longitudinal design that
5 establishes the effect of motivation on gym attendance over time may be a useful avenue for
6 future research. The self-reported nature of the scales should also be taken into consideration
7 when interpreting these results. Further research may endeavour to incorporate more
8 objective measurements of behavior (e.g., data from personal exercise tracking devices, gym
9 or fitness centre access logs). Lastly, as autonomous motivation is facilitated by the support
10 of psychological needs such as competence and relatedness, the influence of others (e.g.,
11 personal trainers, gym partners) on individual motivation at the gym or fitness centre is an
12 important area for further research.

13
14 In terms of practical recommendations emerging from the current research, findings
15 may help to guide health and exercise professionals (e.g., personal trainers, coaches) and
16 inform interventions by highlighting the roles of men's body attitudes and different
17 motivation types in influencing gym attendance. Men with negative body attitudes may still
18 exhibit autonomous forms of motivation in relation to gym attendance. Therefore, the
19 provision of autonomy support that emphasises personally-relevant goals, and planned gym
20 attendance over time, whilst minimizing extrinsic, perhaps more fleeting pursuits, may be of
21 importance to establishing long-term positive health behavior change [45, 46]. Given the
22 poorer psychological and health outcomes associated with forms of controlled motivation
23 [20], trainers and coaches should shift focus from external appearance to more intrinsic
24 elements of exercise in the gym or fitness centre. The role of implicit, non-conscious
25 processes should also be taken into account. Given the indication that these processes may

influence spontaneous gym attendance and the associations between controlled motivation and negative psychological outcomes, routines and action plans to reduce unplanned, controlled reasons for attending the gym may be better [34].

Practical Applications

Gym attendance for men may not always be about increasing muscle mass (i.e., the muscular ideal); but, as was the case in this study, can also be driven by the desire to lose weight. Autonomous motivation and implicit controlled motivation both positively predict gym attendance, this suggests that health practitioners should encourage autonomous forms of motivation, while maintaining awareness of the effects of, implicit controlled motivation – that is, unplanned attendance potentially due to feelings of shame or guilt about their body size and shape.

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Table 1. Means and Zero-order Correlation Matrix for Motivation Measures, Male Body Attitude Measures, and Average Gym Sessions per week

Measures	Mean (SD)	1	2	3	4	5	6	7	8	9	10
1. GSPW	2.546 (1.803)	-									
2. BMI	25.827 (6.617)	-.04	-								
3. M-IAT	.566 (.517)	-.14	-.04	-							
4. PLOC _{aut}	11.895 (2.875)	.52**	-.10	.02	-						
5. PLOC _{con}	8.263 (2.629)	.31**	.07	-.07	.278**	-					
6. GCOS _{aut}	5.510 (.947)	-.08	.03	.34**	.199 ⁺	-.17	-				
7. GCOS _{con}	4.348 (.775)	.03	.01	.06	.24*	-.01	.41**	-			
8. MBAS _{mus}	2.773 (.810)	.21*	-.25*	.13	.19 ⁺	.16	.03	.15	-		
9. MBAS _{BF}	2.736 (1.10)	.22*	.49**	.13	-.01	.35**	-.05	-.05	.25*	-	

Note: GSPW = gym sessions per week (Average); BMI = body mass index; M-IAT = implicit motivation (general); PLOC_{aut} = Perceived locus of causality - autonomous; PLOC_{con} = Perceived locus of causality – controlled; GCOS_{aut} = autonomy orientation; GCOS_{con} = controlled orientation; MBAS_{mus} = Male body attitudes scale – muscle; MBAS_{BF} = Male body attitudes scale – body fat; MBAS_{ht} = Male body attitudes scale – height;

* $p < .05$, ** $p < .01$, ⁺ approaching significance

Table 2. Results of Hierarchical Regression Analyses showing the Contribution of Explicit and Implicit Motivational and Body Attitudinal Measures

Predictor	$\overbrace{adjR^2}^{\text{GSPW}}$	β	t	p
<i>Step 1</i>	-.01			
BMI		-.01	-.04	.97
<i>Step 2</i>	.35**			
BMI		-.09	-.76	.45
M-IAT		-.21*	-2.22	.03
PLOC _{aut}		.56**	5.79	.001
PLOC _{con}		-.07	-.66	.51
GCOS _{aut}		-.10	-.96	.34
GCOS _{con}		.00	.02	.98
MBAS _{mus}		.03	.28	.78
MBAS _{BF}		.32**	2.63	.01
<i>n</i>	87			

Note: GSPW = gym sessions per week (Average); BMI = body mass index; M-IAT = implicit motivation (general); PLOC_{aut} = Perceived locus of causality - autonomous; PLOC_{con} = Perceived locus of causality – controlled; GCOS_{aut} = autonomy orientation; GCOS_{con} = controlled orientation; MBAS_{mus} = Male body attitudes scale – muscle; MBAS_{BF} = Male body attitudes scale – body fat;

* $p < .05$, ** $p < .01$, + approaching significance